

A Methodology to Evaluate the Effectiveness of Watershed-Scale Non-Point Source Pollution Abatement Programs:

Linking Drinking Water Purveyors and the Agricultural Community for Source Water Protection

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Environmental Issue:

Hoover Reservoir is Central Ohio’s largest source of drinking water. The Upper Big Walnut Creek watershed encompasses 190 square miles of predominately agricultural cropland (60%) that drain into Hoover Reservoir. Since 1987, the City of Columbus’ water quality monitoring program has detected seasonally elevated levels of atrazine in Hoover Reservoir



FIGURE 1: Hoover Reservoir

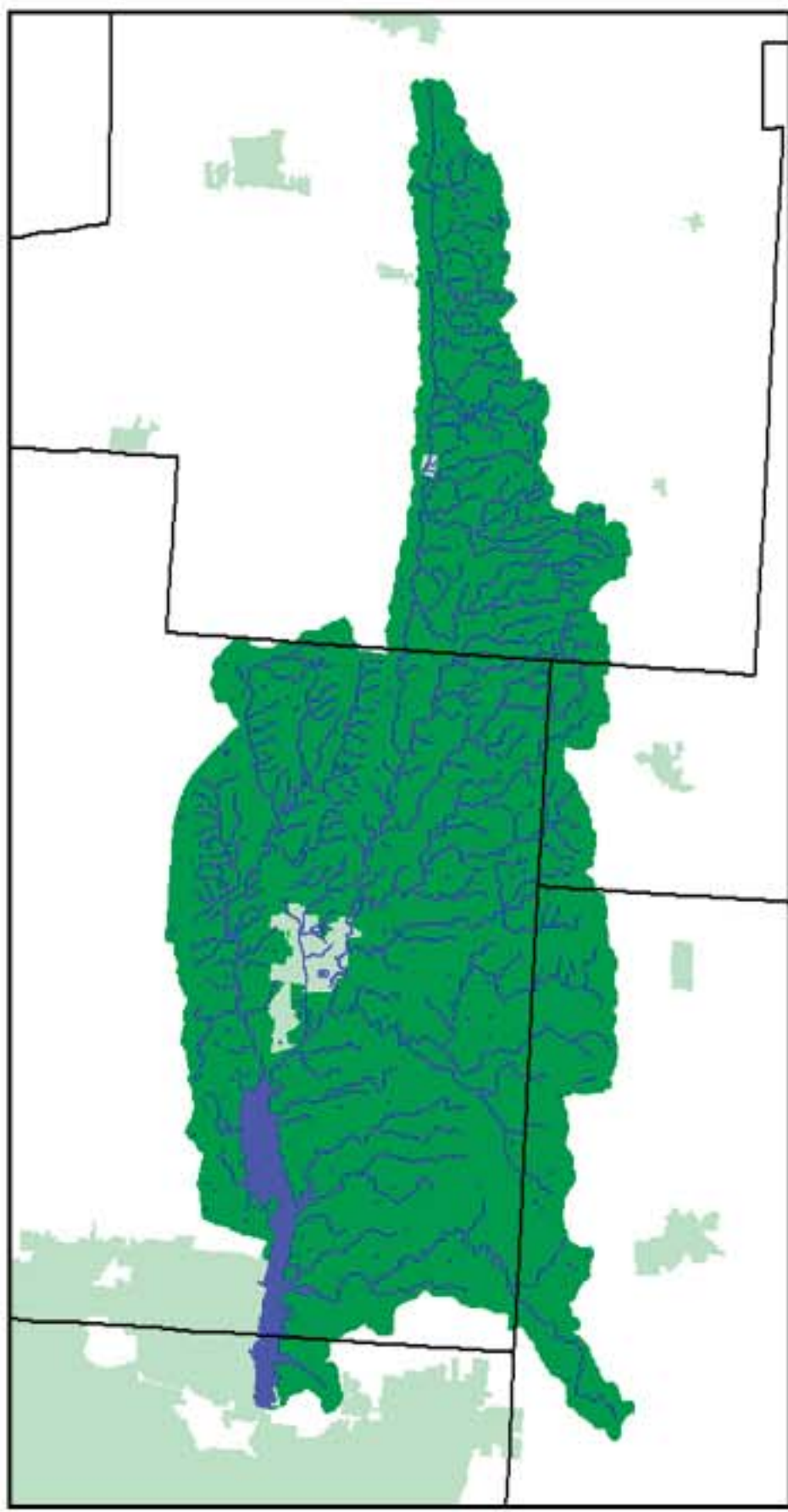


FIGURE 2: Upper Big Walnut Creek Watershed

Technical Solution:

Beginning in 1999, field-scale best management practices (BMPs) were implemented on more than 30,000 cropland acres in the Upper Big Walnut Creek watershed. Although more than \$14 million is committed to the watershed for agricultural BMPs, critical questions remain about the watershed-scale aggregate effectiveness of these BMPs to achieve water quality goals. That is, do the field-scale agricultural BMPs implemented throughout the watershed have the potential to achieve drinking water quality standards in Hoover Reservoir?

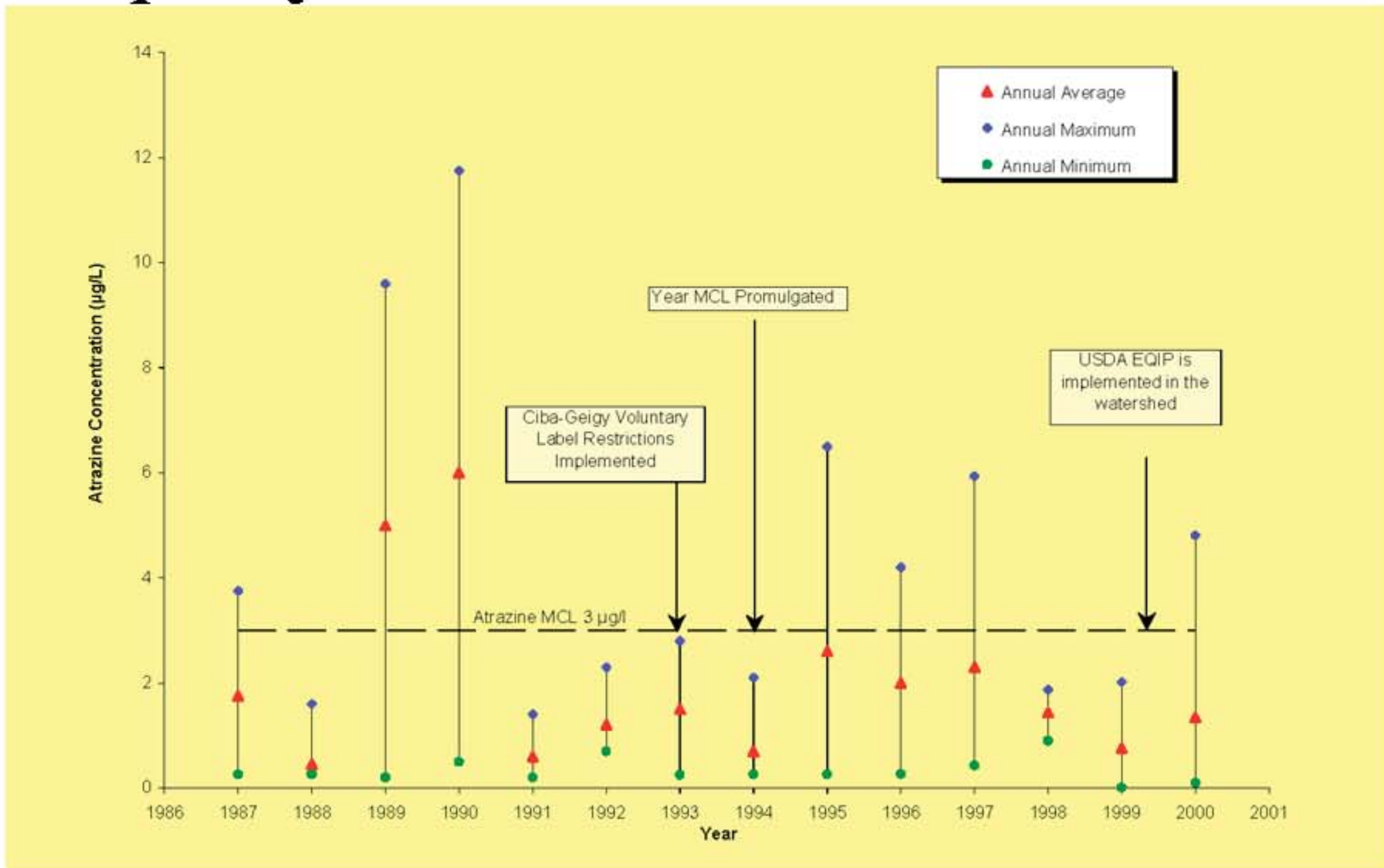


FIGURE 3: Historical atrazine concentration levels in Hoover Reservoir (1987 – 2000).

Impact:

Evaluation of the EQIP program (implementation of BMPs) for the period 1999 and 2004 will be derived from the calibrated watershed atrazine runoff loss and the Hoover Reservoir atrazine mass flux models. The anticipated differences will be calculated between the actual atrazine runoff and modeled atrazine runoff without BMPs during the EQIP implementation period (Figure 4). This will provide a quantitative assessment methodology to determine the water quality benefits from the USDA Environmental Quality Incentives Program in the Upper Big Walnut Creek watershed.

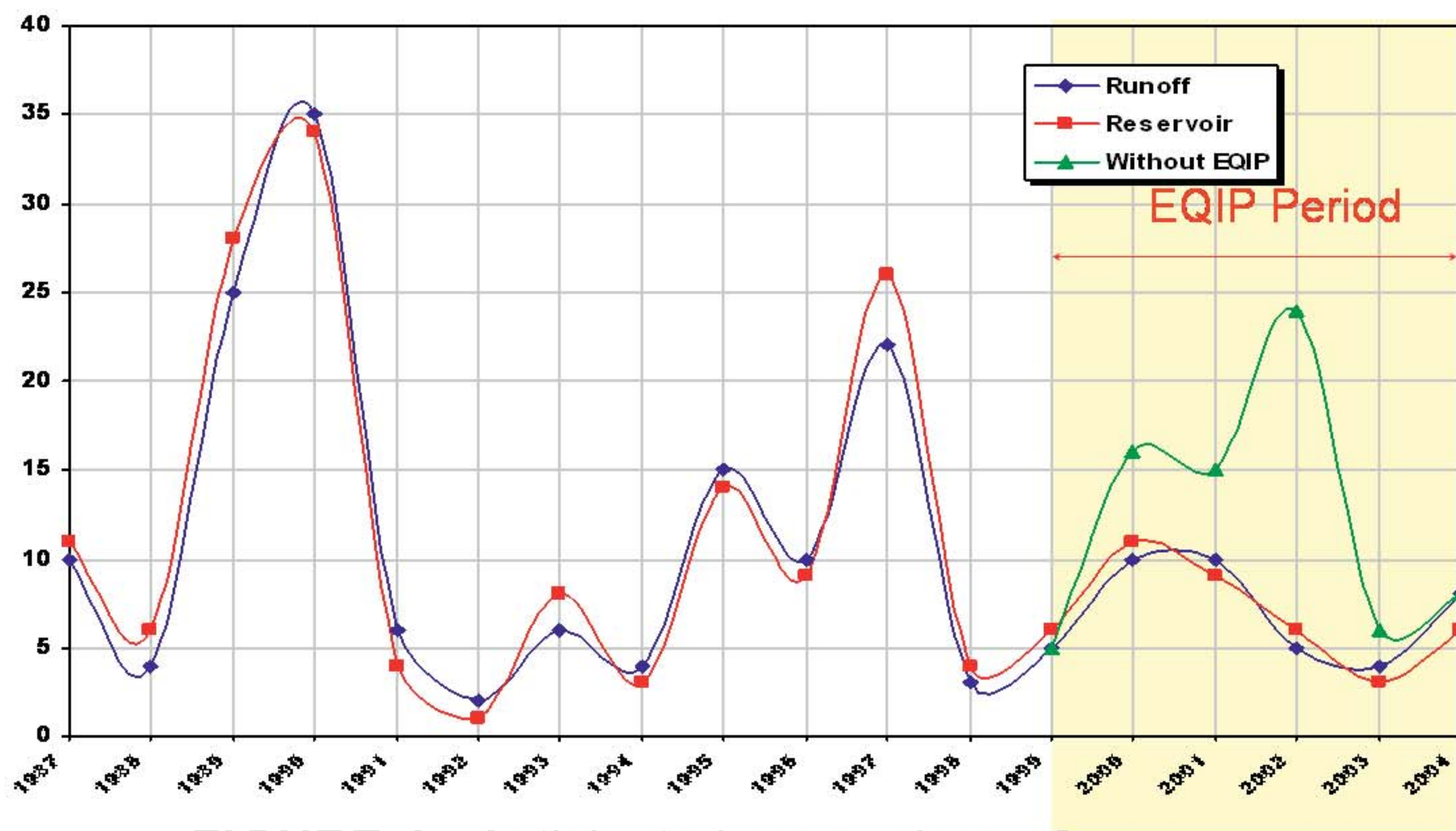


FIGURE 4: Anticipated comparison of annual atrazine loss between models.

Partnerships:

USEPA
Ohio River Valley Water Sanitation Commission
Malcolm Pirnie, Inc.
USDA-National Resources Conservation Service
USDA-NRCS National Water & Climate Center
USDA-Agricultural Research Service
Ohio Department of Natural Resources
Delaware County Soil and Water Conservation Dist.
Upper Big Walnut Creek Watershed Partnership
City of Columbus-Division of Water
Ohio State University
Purdue University
Heidelberg College